Using Scene Based Modeling Approach For APS And DAS Applications

Lon Anderson

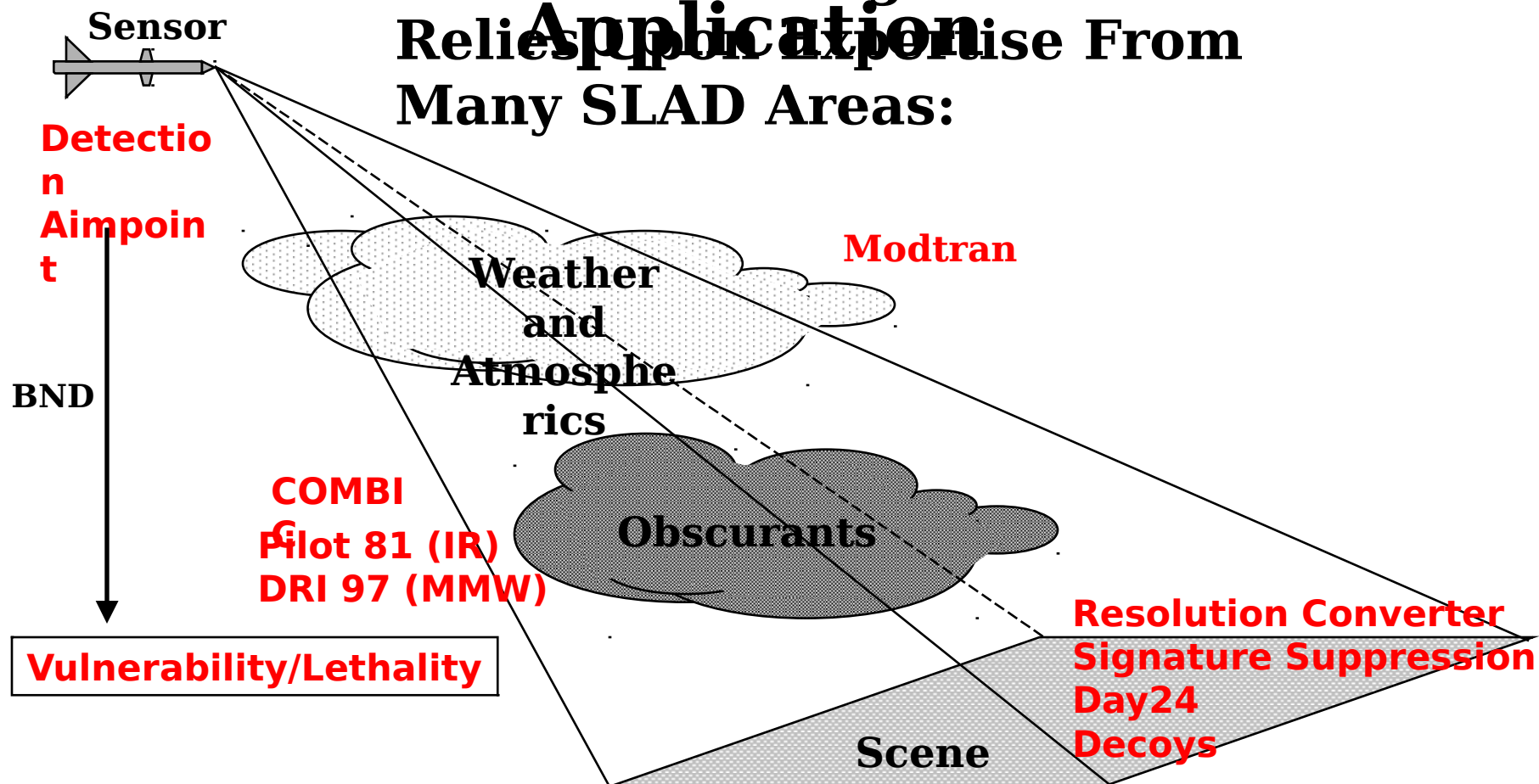*505-678-7667*

Building The Scene-Based Model

Traditional SCIMITAR Application

Sub-Model Integration Relies Upon Expertise From Many SLAD Areas:

Sensor

Detection
Aimpoint

BND

Weather and Atmospherics

Modtran

Obscurants

COMBIC
Pilot 81 (IR)
DRI 97 (MMW)

Vulnerability/Lethality

Resolution Converter
Signature Suppression
Day24
Decoys

Scene

Scene And **C**ountermeasures **I**ntegration For **M**unition **I**nteraction With **TAR**gets

SCIMITAR's intended use is to provide an analytical tool which evaluates munition interaction with ground platforms within a scene specific to both the munition and ground platform. The scene is an operational battlefield environment including the integrated effects of obscurants, decoys, atmospherics, background clutter, and platform signature characteristics.

The model provides a prediction of munition

Creating The Dynamic Model

◆ Traditional SCIMITAR is based upon autonomous munitions, and considers snapshots in time

◆ Dynamic, man-in-the-loop approach:
  ◆ Build "frames" using the clutter, target signature, and smoke generation capabilities of SCIMITAR, matching these to properties of the FLIR sight.
  ◆ Animate target motion and smoke cloud motion.
  ◆ Play these frames in a JAVA framework, real-time. The user (man-in-the-loop) tracks the target and the aimpoints are recorded frame by frame. Different clutter, smoke, and target scenarios can be implemented.
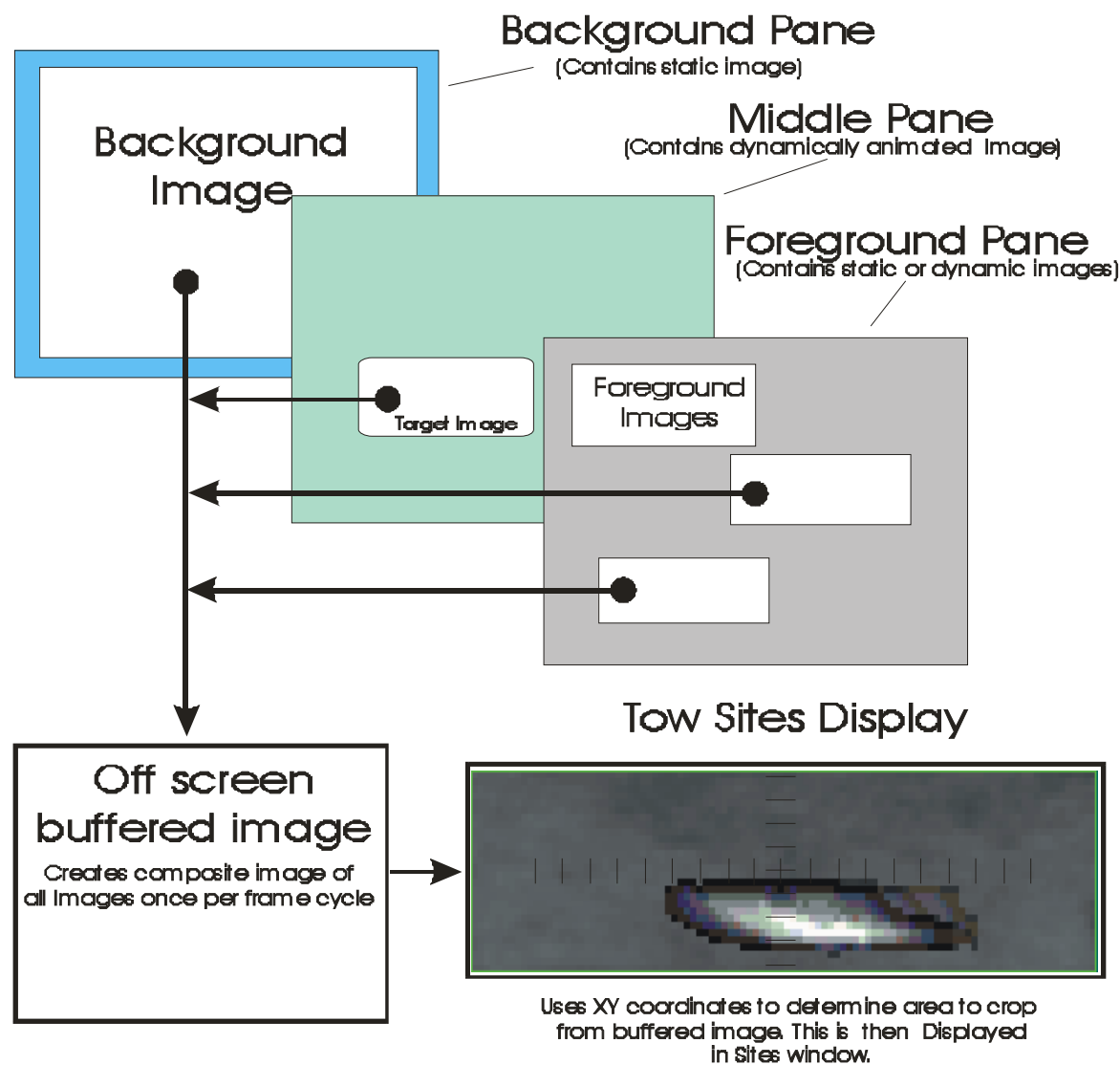 ◆ These aimpoints (relative to target) are passed to BND for further analysis.

Single Frame of Scene

Moving vehicle behind smoke cloud

Planned Vector Animation

Background Pane
(Contains static image)

Background Image

Middle Pane
(Contains dynamically animated image)

Foreground Pane
(Contains static or dynamic images)

Target Image

Foreground Images

Tow Sites Display

Off screen buffered image
Creates composite image of all images once per frame cycle

Uses XY coordinates to determine area to crop from buffered image. This is then Displayed in Sites window.

Gunner Interface

Building The
APS Linkage

- ◆ We can model missile aimpoints, timelines, scene based effects readily
- ◆ We do not have an intercept model for the APS radar, but can play an envelope of intercepts, before this is passed to the lethality or vulnerability model.

Goals

♦ Develop SACLOS versus SHTORA simulation to prove out soft kill methodology. Enables us to understand the challenges involved. Also forces us to formalize and work through the link between IEPD and BND, in order to pass meaningful aimpoints to play in V/L models.

♦ Complete by June 2000

♦ Next effort will address new scenarios and begin working out hard kill isssues. For the hard kill case, we need to consider missile intercept by the APS, and we need to pay more attention to marrying the aimpoints to the missile flyout model.

♦ Analyze FCS and FSCS hit avoidance techniques vs. SACLOS missiles

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